Finding the silent killer -- a biomarker test for atherosclerosis

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Furring of the arteries, atherosclerosis, is a leading cause of death across the world. Atherosclerosis leads to peripheral arterial disease, coronary heart disease, stroke and heart attacks. However, atherosclerosis is a sneaky killer - most people do not realize they have it until they have cardiovascular disease (CV). New research published in BioMed Central's open access journal *BMC Medical Genomics* has identified a set of biomarkers which can be used to test for early stage atherosclerosis.

Researchers from the University of Virginia compared biomarkers isolated from monocytes (a type of white blood cells) in blood of patients with a family history of high cholesterol levels (familial hypercholesterolemia) to healthy controls. 363 genes were found to be differentially regulated (turned up or down) between the two groups. Familial hypercholesterolemia is a well-known genetic disease caused by a mutation in the LDL receptor which causes early onset atherosclerosis. People with two copies of the mutated LDL receptor (homozygous) have an even higher risk of atherosclerosis than those with one mutated and one normal copy (heterozygous).

Dr Feng Cheng and the team were able to reduce this initial set to 56 genes by focusing on genes directly involved in inflammation, lipid, carbohydrate and protein metabolism, and genes known to be responsible for the maintenance of blood cells. Genome-wide expression profiling, gene functional inference and multivariate statistical techniques were further used to 'fine tune' the test. This 'prediction array' was able to spot the people with high cholesterol, separating the patients

with familial hypercholesterolemia from the control group.

Dr Jae Lee, who led the study, explained "By splitting our 56 genes into three sets, and using the COXEN algorithm, which was originally developed to identify genes involved in cancer with potentially diagnostic or therapeutic properties, we found that we could further refine our test and separate out the very high risk group." Dr Ellen Keeley continued, "This biomarker test, which only requires a blood sample, could be further developed to predict the risk of silent atherosclerosis in clinical practice."

 More information: www.biomedcentral.com/bmcmedgenomics/

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